

With regard to the rejection of Claims 5-14 under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way to enable one skilled in the art to make or use the invention, Applicant respectfully traverses this rejection. The Office Action states at page 2, paragraph 1, that "the Applicant does not disclose what material the protective film, that prevents silicidation of silicon, is made of or/and physical characteristics that will be necessary for any one skilled in the art to recreate the disclosed invention." However, at page 9, lines 3-9 of the specification, a silicon nitride film is described as being formed on the buffer oxide film 54. By patterning using a photoresist, the silicon nitride film is selectively removed to remain in an inductor region, thereby forming a protective film 56. Based on this description, Applicant respectfully submits that an exemplary enabling material for the protective film was disclosed in the original specification, and therefore respectfully requests that this rejection be withdrawn.

With regard to the rejection of Claims 1 and 2 under 35 U.S.C. § 102(b) as anticipated by the AAPA, Applicant respectfully submits that this rejection has been overcome by this amendment. Claim 1, from which Claim 2 depends, recites: "a protruding portion which is formed on the top face of the substrate and the top of which serves as a dummy element for controlling a chemical mechanical polishing process ... wherein said protruding portion is formed to avoid being positioned in a region directly below said conductive layer."

As described in the specification at page 2, line 25, through page 3, line 9, manufacturing a relatively large inductor requires a large area on a substrate. When a large substrate area is required, it is necessary to arrange dummy elements to avoid dishing during CMP processing. Specifically, when the inductor is formed on an STI portion, dishing occurs during CMP processing. To address the problem of dishing, the semiconductor device of the

AAPA has protruding portions which are also formed in a region in the substrate directly below the conductive layer (see Figures 19 and 20). In the AAPA, the dummy elements are arranged just below the inductor to prevent the dishing problem. However, the existence of the dummy element directly below the inductor results in an increase in coupling between the wiring and the substrate. Consequently, because the AAPA dummy element is below the inductor, part of the high-frequency energy leaks into the substrate, thereby lowering Q-value characteristics of the inductor.<sup>2</sup>

By contrast, the semiconductor device according to Claim 1 includes a protruding portion which is formed *to avoid* being positioned in a region directly below the conductive layer. This arrangement of the protruding portion solves the dishing problem during the CMP processing, while maintaining the Q-value characteristics of the inductor.<sup>3</sup>

Accordingly, as the AAPA neither discloses nor suggests the Applicant's claimed configuration, Applicant submits that pending Claim 1 patentably distinguishes over the AAPA. Likewise, dependent Claim 2 is considered to patentably distinguish over the AAPA for at least the reasons above-noted with respect to Claim 1, from which Claim 2 depends.

With regard to the rejection of Claims 3 and 4 under 35 U.S.C. § 103(a) as unpatentable over AAPA, in view of the '121 patent, Applicant respectfully submits that this rejection has been overcome. As noted above, Claim 1, from which Claims 3 and 4 depend, recites: "a protruding portion which is formed on the top face of the substrate and the top of which serves as a dummy element for controlling a chemical mechanical polishing process ...

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<sup>2</sup>Specification, page 3, lines 10-16.

<sup>3</sup>Specification, page 5 line 33 through page 6, line 4.

wherein said protruding portion is formed to avoid being positioned in a region directly below said conductive layer.”

As further noted above, the AAPA fails to disclose or suggest the features recited in pending Claim 1. Applicant respectfully submits that the ‘121 patent fails to remedy the defects above-noted with respect to the AAPA.

The ‘121 patent relates to a method of reducing substrate losses and inductors. The ‘121 patent describes forming a second oxide layer covering both the epitaxial layer and the first oxide layer using chemical vapor deposition followed by CMP, thereby merging the second oxide layer with the first oxide layer to form an inductor oxide layer.<sup>4</sup> However, the ‘121 patent does not disclose or suggest (and the Office Action fails to address) the Applicant's claimed limitations. Specifically, the ‘121 patent does not address any type of protruding portion formed on the top face of the substrate. The ‘121 patent certainly fails to address that the "protruding portion is formed to avoid being positioned in a region directly below said conductive layer."

Consequently, as neither the AAPA nor the ‘121 patent, either alone or in combination, discloses or suggests the Applicant's claimed limitations, Applicant respectfully submits that pending Claim 1 patentably distinguishes over these two references. Likewise, pending dependent Claims 3 and 4, which depend from Claim 1, are respectfully submitted to patentably distinguish over the AAPA and the ‘121 patent for at least the reasons above-noted with respect to Claim 1.

With regard to the rejection of Claims 5-7 and 10-12 under 35 U.S.C. § 103(a) as unpatentable over the AAPA in view of the ‘257 patent, Applicant respectfully submits that

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<sup>4</sup>The ‘121 patent. Col. 3, lines 43-48.

the Office Action has failed to provide a *prima facie* case of obviousness. Claim 5 recites, in relevant part: "a protective film which is formed between the substrate and said conductive layer and prevents silicidation of said protruding portion."<sup>5</sup>

As admitted in the Office Action at page 6, paragraph 6, "the Applicant's Admitted Prior Art ... does not teach a layer that will prevent silicidation of the protruding portions of the silicon substrate." Applicant respectfully submits that the '257 patent fails to remedy the admitted deficiencies of the AAPA.

The '257 patent describes a method of forming a silicide preventing layer 71 in manufacturing an LCD. The silicide preventing layer 71 is formed between a doped amorphous silicon region 61, 62 and source and drain electrodes 81, 82.<sup>6</sup> However, the '257 patent neither discloses nor suggests a protective film that prevents silicidation of the protruding portion serving as a dummy element. From this description, it is therefore evident that the '257 patent neither discloses nor suggests the Applicant's claimed limitations.

Furthermore, the '257 patent discloses that the silicide preventing layer 71 is preferably less than about 20 Å thick, which is thin enough to reduce and preferably minimize the contact resistance.<sup>7</sup> By contrast, as described in page 8, lines 22-31, of the specification, a protective film as defined in Claim 5 enables prevention of the resistance of the dummy element from decreasing, thereby achieving a high frequency effect. Specifically, leakage of high frequency waves into the substrate may be reduced and a Q-value of the inductor may be maintained to be a large value. Thus, the function of the silicide preventing layer 71 of the

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<sup>5</sup>Claims 6, 7, and 10-12 depend from Claim 5.

<sup>6</sup>Song, col. 2, lines 18-28.

<sup>7</sup>Id. at col. 2, lines 28-30.

'257 patent is inconsistent with the function of the protective film recited in Claim 5. It is therefore evident that the '257 patent teaches away from the Applicant's claimed limitations. Accordingly, Applicant respectfully submits that one of ordinary skill in the art would not have been motivated to modify the AAPA in the manner suggested by the Office Action.

Moreover, Applicant respectfully submits that there is no support in the teachings of the AAPA, the '257 patent, or the prior art in support of the proposed combination. The Office Action states at page 6 that the proposed combination of these references would be obvious to one of ordinary skill in the art. However, the Office Action fails to cite to any teachings in any references that recognize the above-noted deficiencies found in the references of record. Accordingly, because the proposed combination appears to be based upon hindsight reconstruction, Applicant respectfully requests that the rejection be withdrawn unless a reference is properly cited in support of the Office Action's assertions of obviousness.

Consequently, as the proposed combination of the AAPA and the '257 patent fails to disclose or suggest the Applicant's claimed limitations, Applicant respectfully submits that Claim 5 patentably distinguishes over the AAPA and the '257 patent, either alone or in combination. Likewise, dependent Claims 6, 7, and 10-12 are considered to patentably distinguish over the AAPA and the '257 patent, either alone or in combination, for at least the reasons above-noted with respect to Claim 5, from which these claims depend.

In response to the rejection of Claims 8, 9, 13, and 14 under 35 U.S.C. § 103(a) as unpatentable over the AAPA in view of the '257 patent, further in view of the '121 patent, Applicant respectfully submits that the Office Action has failed to provide a *prima facie* case of obviousness.

Claims 8, 9, 13, and 14 depend from Claim 5. As noted above, neither the AAPA nor the '257 patent, either alone or in combination, discloses or suggests the limitations recited in Claim 5.

Applicant respectfully submits that the '121 patent fails to remedy the deficiencies above-noted with respect to the AAPA and the '257 patent. As earlier noted, the '121 patent does not describe any form of protruding elements for use in preventing dishing during CMP processing. Therefore, the '121 patent fails to disclose or suggest "a protective film which is formed between the substrate and said conductive layer and prevents silicidation of said protruding portion," as recited in pending Claim 5.

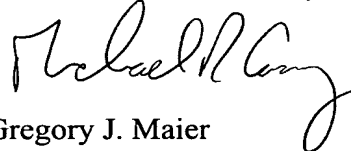
Moreover, Applicant respectfully submits that there is no basis in the teachings of the AAPA, the '257 patent, the '121 patent, or the prior art to support the proposed combination. Specifically, the Office Action fails to point to any specific teaching to support the proposed combination. Applicant therefore respectfully submits that the proposed combination of these three references is based solely upon hindsight.

Accordingly, as none of the AAPA, the '257 patent, and the '121 patent, either alone or in combination, discloses or suggests the Applicant's claimed limitations, Applicant respectfully submits that pending Claim 5 patentably distinguishes over these three references, either alone or in combination. Likewise, dependent Claims 8, 9, 13, and 14 are considered to patentably distinguish over the cited references for at least the reasons above-noted with respect to Claim 5, from which these claims depend.

Consequently, in view of the foregoing discussion and present amendments, Applicant respectfully submits that the pending application is in condition for immediate allowance. An early and favorable action is therefore respectfully requested.

Respectfully submitted,

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IN THE CLAIMS

Please amend Claims 1 and 10 as follows:

--1. (Twice Amended) A semiconductor device comprising:

a substrate;

a protruding portion which is formed on the top face of the substrate and the top of which serves as a dummy element for controlling a chemical mechanical polishing process; and

a conductive layer which is formed on the substrate so as to have a spiral shape and which serves as an induction element,

wherein said protruding portion is formed [in a region other than] to avoid being positioned in a region directly below said conductive layer.

10. (Twice Amended) A semiconductor device as set forth in claim 5, wherein said protruding portion is formed [in a region other than] to avoid being positioned in a region directly below said conductive layer.--